

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 14, 2010 has been entered.

Response to Amendment

Applicant's amendment to the claims filed April 14, 2010 has been entered. Claims 45-50, 52, 54-57 and 59-62 have been canceled. Claims 63-77 are new.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 63-69 and 73-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 6,409,949) in view of Bandera et al. (US 2002/0100995), Vogt et al. (US 6,589,463), Hills (US 4,849,113) and either of Bentivoglio (US 6,153,093) or Rosato (Extruding Plastics – A Practical Processing Handbook, 1998).

Regarding claim 63-68, Tanaka et al. teach the basic claimed method of extruding reproduced/recycled PET flakes without precrystallization or predrying or any substantial pretreatment in a twin-extruder (col. 4, lines 32-35) and degassing the melt in the extruder (col. 4, lines 42-46; col. 6, lines 15, 27-31). Tanaka et al. teach feeding a chain-lengthening substance to the interior of the extruder downstream of the degassing location of the extruder (col. 6, lines 20-22; col. 4, lines 45-51) and spinning the melt coming out of the extruder through a die, not limited to pelletizing, to make a desired product (Table I; col. 4, lines 47-55; col. 6, lines 42-47). Tanaka et al. teach that the PET is supplied to the extruder with a metering screw (col. 4, lines 40-42) and teach feeding the melt to the downstream process with a gear pump (col. 4, lines 50-55). Tanaka et al. do not expressly teach what PET products can be made via extrusion through the extrusion die, the claimed filtering/control method, or the amount of screw filling in the extruder.

Bandera et al. teach in an analogous process a method of extruding waste/recycled polyethylene terephthalate (PET), such as PET granules from bottles (paragraph [0020]), without any precrystallization or predrying steps. In the method, Bandera et al. feed the still humid PET to a twin screw extruder such that the flights of the extruder screw are only partially filled and degas/vent the interior of the screw in order to remove moisture from the PET (Abstract; Figure 2; paragraphs [0010, 0019, 0020, 0025-0027, 0029-34, 0040] and claim 1). Bandera et al. teach that the degree of flight filling impacts the efficiency of venting while extruding PET (paragraph [0030]), as such; Bandera et al. establish the degree of flight filling as

a result effective variable that would have been readily optimized. The examiner notes that in one interpretation, recycled/waste PET intrinsically contains some degree of contamination/dirt. Bandera et al. teach the screws are co-rotating in the same direction (paragraph [0026]).

Additionally, Vogt et al. (Figure 1 (29) (30) (31)) teach a process of producing an extruded film/web from PET via an extrusion and stretching process wherein the material is extruded through a filter (13) and cooled, and is then stretched longitudinally with rolls (23) and (25) a first time, followed by stretching longitudinally a second time with rolls (54) and (56), and is then annealed/fixed with roll (59) and cooled/quenched with roll (61).

Furthermore, Bentivoglio (Abstract; col. 1, lines 10-16; col. 2, lines 8-67; col. 3, lines 56-64) and Rosato (pages 84-89) each teach extruding resins through a filter, backflushing the contaminants/dirt from the filter in response to differential pressure across the filter which increases the time between complete filter changes. Additionally, Hill discloses as conventional, adjusting extruder speed, as required, to account for the increased clogging of a filter downstream of the extruder (col. 13, line 63 – col. 14, lines 44).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Tanaka et al. and to have employed PET waste materials as suggested by Bandera et al. while controlling the amount of screw filling as suggested by Bandera et al., including to values within the claimed range, since Bandera et al. suggest the degree of screw filling impacts the efficiency of the venting in the extruder thereby establishing the degree of screw filling as a result effective variable that would have been readily optimized.

Further, it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Tanaka et al. and to have formed a PET film/web by longitudinally stretching the extruded film/web twice followed by

fixing/annealing the film/web, as suggested by Vogt et al., since Vogt et al. suggest that one desirable product to be produced from PET is a film/web and that such films/webs are produced by a combination of stretching steps and annealing/fixed the stretched film/web.

Further, it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Tanaka et al. and to have employed a backflush filter, as suggested by either of Bentivoglio or Rosato, for the purpose of increasing production output and increasing the time between filter changes. Additionally, it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have adjusted the extruder speed as the filter became plugged, as disclosed as conventional by Hills, for the purpose of maintaining a constant extruder output/output pressure.

As to claim 69, Tanaka et al. employ vacuum pumps (8) and (9) and Bandera et al. teach the venting is done with a hood under vacuum (paragraph [0027]).

As to claims 73 and 74, Hills discloses adjusting the extruder speed (col. 14, lines 1-20). Further, it is noted that the feed rate to the extruder would be adjusted/controlled to zero when the screens needed to be ultimately changed after many backflushes (Rosato, pages 84-89).

As to claims 75-77, Vogt et al. (Figure 1 (29) (30) (31)) teach a process of producing an extruded film/web from PET via an extrusion and stretching process wherein the material is extruded through a filter (13) and cooled, and is then stretched longitudinally with rolls (23) and (25) a first time, followed by stretching longitudinally a second time with rolls (54) and (56), and is then annealed/fixed with roll (59) and cooled/quenched with roll (61). The process involves preheating the web to 85 °C, before the first orientation and preheating the material to 100 °C before the second orientation (col. 5, line 36-col. 6, line 27), both temperatures are above the glass transition of PET. Additionally, Vogt et al. disclose a final

stretching step immediately prior to wrapping the film (66) and quench the film/web (61) immediately after annealing/fixing (59). It would have been obvious to one having ordinary skill in the art to have modified the method of Tanaka et al. as suggested by Vogt et al., for the reasons previously set forth above.

Claim 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 6,409,949) in view of Bandera et al. (US 2002/0100995), Vogt et al. (US 6,589,463), Hills (US 4,849,113) and either of Bentivoglio (US 6,153,093) or Rosato (Extruding Plastics – A Practical Processing Handbook, 1998), as applied to claims 63-69 and 73-77 above, and further in view of either of VanBuskirk et al. (US 5,281,676) or Pfaendner et al. (US 5,807,932).

Regarding claim 70, the combination teaches feeding at least one chain-lengthening substance as set forth above, but do not explicitly teach the chain-lengthening substance is a lactam or oxazole derivative. However, VanBuskirk et al., teach processing PET with lactam derivatives as the chain-lengthening substances (col. 3, lines 24-31; col. 4, lines 31-52). And Pfaendner et al. disclose that oxazolines are known chain extenders suitable for increasing the molecular weight of recycled polyesters such as PET (col. 1, line 6-col. 2, line 38, in particular, col. 2, line 16; col. 6, lines 33-39).

Therefore it would have been *prima facie* obvious to one having ordinary skill at the time of the claimed invention to have employed the lactam derivative chain lengthening agent taught by VanBuskirk et al. in the method of Tanaka et al. because, as taught by VanBuskirk et al., lactam derivatives are well-suited for use as chain lengthening substances in PET applications and do not result in any undesired toxic byproducts such as phenol comprising compounds (col. 4, lines 46-52).

Additionally, it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to have employed an oxazoline based chain extender in the method of Tanaka et al., as suggested by Pfaendner et al., since Pfaendner et al. suggest such materials are art recognized equivalent alternative chain extenders suitable for utilization with PET.

Claims 71 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 6,409,949) in view of Bandera et al. (US 2002/0100995), Vogt et al. (US 6,589,463), Hills (US 4,849,113) and either of Bentivoglio (US 6,153,093) or Rosato (Extruding Plastics – A Practical Processing Handbook, 1998), as applied to claims 63-69 and 73-77 above and further in view of Strobel et al. (US 6,585,920).

As to claims 71 and 72, the combination teaches the method as set forth above. However, Strobel discloses that cooling drums and water baths are art recognized equivalent alternative means for cooling extruded films (col. 6, lines 51-57).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have employed an art recognized equivalent method of cooling, such as a water bath, as suggested by Strobel in the combined method since it has been held that employing art recognized equivalents suitable for the same purpose is *prima facie* obvious.

Response to Arguments

Applicant's arguments filed April 14, 2010 have been fully considered. Applicant's amendment to the claims has overcome the 35 USC 112 first paragraph rejection. Applicant's other arguments have been fully considered, but they are not persuasive. Essentially, applicant argues that the rejection is a complicated and piecemeal rejection based on at least five

references at any one time. The argument further implies that the rejection is based upon hindsight reasoning. This argument is not persuasive. The examiner notes and submits that the basic claimed method is disclosed in each of Tanaka et al. and Bandera et al. or in a straight forward combination of the two of these references.

The examiner submits that one having ordinary skill would have understood that the reason neither Tanaka et al. nor Bandera et al. specifically discuss what PET product is made downstream from the extruder is that the suggestion from the references is that the methods are applicable to extruded PET products generally. The focus of their disclosures was not the downstream product but a method to afford the production of downstream products. Accordingly, the examiner submits that the Vogt et al. reference is quite applicable to show an extruded PET product that is combinable with the methods of Tanaka et al. and Bandera et al. Further, the examiner submits that the reason neither Tanaka et al. nor Bandera et al. provide detailed teachings regarding the filtering and pressure measurements and control in response to such pressure measurements is because such concepts and limitations are conventional and routine in the extrusion and polymer processing art. These limitations are provided from the other secondary references. As such, the examiner submits that in view of the presently presented claims the rejection is not based on hindsight or piecemeal reconstruction from references that don't clearly fit together, but is proper to render the claims *prima facie* obvious.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY WOLLSCHLAGER whose telephone number is (571)272-8937. The examiner can normally be reached on Monday - Thursday 6:45 - 4:15, alternating Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeff Wolschlag/
Primary Examiner
Art Unit 1791

April 19, 2010